Korelasi tebal lemak regio abdominal serta gluteofemoral berdasarkan ultrasonografi dan rasio persentase massa lemak android/gynoid berdasarkan dual energy x-ray absorptiometry = The correlation of fat thickness in abdominal and gluteofemoral region by ultrasonography to android/Gynoid fat Mass percentage ratio by dual energy X-Ray absorptiometry

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Abstrak

Latar Belakang: Obesitas merupakan masalah kesehatan utama yang ditemui di berbagai negara. Massa lemak tubuh bagian atas (regio abdominal/android) berhubungan dengan profil kardiometabolik yang buruk sedangkan massa lemak tubuh bagian bawah (regio glutefemoral/gynoid) merupakan faktor protektif. Nilai rasio lemak android/gynoid (rasio A/G) yang didapatkan dari dual energy x-ray absorptiometry (DXA) merupakan prediktor parameter risiko kardiovaskular. Ultrasonografi (USG) merupakan modalitas yang menjanjikan untuk evaluasi komposisi tubuh serta memiliki korelasi yang sangat baik dengan DXA dalam memprediksi massa lemak tubuh total. Namun belum terdapat studi yang menggunakan USG untuk memperkirakan rasio A/G menurut DXA. Tujuan: Mengetahui korelasi antara tebal lemak subkutis dan viseral yang diukur dengan USG di regio abdominal serta gluteofemoral dan rasio A/G yang diukur dengan DXA. Metode: Sebanyak 28 subjek penelitian dilakukan pemeriksaan DXA untuk menilai rasio A/G. Kemudian subjek menjalani pemeriksaan USG untuk menentukan tebal lemak regio abdominal dan gluteofemoral pada hari yang sama atau maksimal tujuh hari setelah pemeriksaan DXA. Dilakukan analisis korelasi rasio A/G dengan tebal lemak subkutis dan viseral regio abdominal serta tebal lemak subkutis regio gluteofemoral. Setelah itu dilanjutkan dengan mencari formula regresi linear serta formula regresi multipel untuk mencari nilai rasio A/G berdasarkan tebal lemak pada pemeriksaan USG. Hasil: Pada jenis kelamin perempuan didapatkan korelasi kuat antara tebal lemak subkutis regio abdominal (R = 0,82 ; p = 0,000), krista iliaka (R = 0,77 ; p = 0,001), abdominal atas (R = 0,80 ; p = 0,001), dan abdominal bawah (R = 0,85 ; p = 0,000) dengan rasio A/G. Korelasi sedang didapatkan antara tebal lemak subkutis di regio supraspinale (= 0,62 ; p = 0,017) dan erector spinae (= 0,54 ; p = 0,049), serta tebal lemak viseral abdominal di pertengahan garis xipho-umbilikal (R = 0,66 ; p = 0,011), dan 5 cm di atas umbilikal (R = 0,55 ; p = 0,041) dengan rasio A/G. Analisis multivariat kelompok jenis kelamin perempuan menghasilkan formula rasio A/G = 0,295 - 0,019(tebal lemak subkutis abdominal atas) + 0,024(tebal lemak subkutis abdominal bawah) + 0,006(tebal lemak viseral abdomen di pertengahan xipho-umbilikal) dengan nilai koefisien determinasi (R2) = 0,823. Kesimpulan: Pada jenis kelamin perempuan, semakin tebal lemak subkutis dan viseral regio abdominal, semakin besar rasio A/G. Pada jenis kelamin perempuan, tebal lemak subkutis di regio abdominal atas, tebal lemak subkutis di regio abdominal bawah, dan tebal lemak intraabdominal di pertengahan garis xipho-umbilikal dapat digunakan untuk memprediksi rasio A/G jika tidak terdapat sarana pemeriksaan DXA.

.....Background: Obesity is a major health problem that is encountered in various countries. Upper body fat mass (abdominal / android region) is associated with a poor cardiometabolic profile while lower body fat mass (glutefemoral / gynoid region) is a protective factor. The value of the android / gynoid fat ratio (A/G

ratio) obtained from dual energy x-ray absorptiometry (DXA) is a predictor of cardiovascular risk parameters. Ultrasonography (US) is a promising modality for evaluation of body composition and has a very good correlation with DXA in predicting total body fat mass. However, there are no studies using ultrasound to estimate the A/G ratio according to DXA. Purpose: Knowing the correlation between the thickness of the subcutanoeus and visceral fat as measured by ultrasound in the abdominal and gluteofemoral regions and the A / G ratio as measured by DXA. Methods: A total of 28 subjects completed DXA examinations to assess the A/G ratio. Then the subject underwent US examination to determine the fat thickness in abdominal and gluteofemoral region on the same day or maximum of seven days after the DXA examination. Correlation analysis was performed between A/G ratio and the thickness of the subcutaneous and visceral fat in the abdominal region, and subcutaneous fat thickness in the gluteofemoral region. We also find linear regression formulas and multiple regression formulas to find the A/G ratio value based on the thickness of fat on ultrasound examination. Result: female group showed a strong correlation between the thickness of the subcutaneous fat in the abdominal region (R = 0.82; p = 0.000), iliac crest (R = 0.77; p = 0.001), upper abdominal (R = 0.80; p = 0.001), and lower abdominal (R = 0.85; p = 0.000) with A/G ratio. A moderate correlation was obtained between the thickness of the subcutaneous fat in the supraspinale region (= 0.62; p = 0.017), erector spinae (= 0.54; p = 0.049), and the thickness of the abdominal visceral fat in the middle of the xipho-umbilical line (R = 0.66; p = 0.011), and 5 cm above umbilical (R = 0.55; p = 0.041) with A/G ratio. Multivariate analysis of the female group resulted in the formula: A/G ratio = 0.295 - 0.019 (thickness of upper abdominal subcutaneous fat) + 0.024 (thickness of lower abdominal subcutaneous fat) + 0.006 (thickness of abdominal visceral fat in the middle of xipho-umbilical) with a coefficient of determination (R2) = 0.823. Conclusion: In female group, the thicker the subcutaneous and visceral fat in the abdominal region, the greater the A/G ratio. For female group, the thickness of the subcutaneous fat in the upper abdominal region, the thickness of the subcutaneous fat in the lower abdominal region, and the thickness of the intraabdominal fat in the middle of the xipho-umbilical line can be used to predict the A/G ratio if DXA is not available.